jean-françois**pambrun**

researcher | engineer | software developer

about

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github://jpambrun

languages

french/english

programming

java, javascript
matlab, python
linux, git, c, c++
latex, tensorflow
azure, mongodb
docker, gcs
kubernetes
aws, spark
node, sql
deltalake
postgres
trino

standards

dicom, ihe, hl7
jpeg 2000, jpip

interests

medical imaging
image compression
machine learning
image analysis
infrastructure
performance
scalability
rendering

† not a member of the OIQ
‡ fast-track phd admission

education

2011-2016 **Ph.D. in electrical engineering** École de technologie supérieure (ÉTS)
improving medical image compression and transmission
- develop a novel image quality metric adapted to diagnostic imaging
- propose a novel jpeg 2000 bit allocation mechanism
- improve streaming for large image series (ct, mr, tomo, etc.)
- skills: research, compression, streaming, matlab, java, c++, itk/vtk

2009-2010 **M.Eng. in electrical engineering (incomplete‡)** École de technologie supérieure (ÉTS)
evaluation of the diagnostic quality of lossy compressed medical images
- study medical image quality assessment and diagnostic losslessness
- quantify the ct acquisition parameters that affect compressibility
- skills: research, compression, matlab, java, c++, itk/vtk, cuda

2005-2009 **B.Eng. in electrical engineering** École de technologie supérieure (ÉTS)
information technologies and telecommunication specialization

experience

2023-present **Principal Data Platform Engineer** VIDA Diagnostics
Imaging and clinical information datalake for ML and AI
- lead the implementation of a cloud-based datalake for clinical data
- contribute to the implementation of ETL pipelines
- design and implement a data platform for machine learning
- skills: aws, spark, python, kubernetes, deltalake, trino

2020-2023 **Principal Architect** Change Healthcare
cloud-based PACS lead architect
- lead a team of architects building the next generation of cloud PACS
- oversee all application areas including frontend, backend and infrastructure
- define and measure key performance indicators
- implement POCs to support technology choices and orientations
- implement production monitoring and observability infrastructure
- lead production issue investigations as they arise
- skills: node, kubernetes, gcp, chromium, dicom, high-availability

2018-2020 **Data Scientist** Change Healthcare
FDA-approved pixel-based body-part classification for more relevant priors
- work with academic and clinical partners to acquire anonymized data
- design data ingestion and cleaning pipelines
- implement 3d bounding box dicom labeling tool across frames of reference
- design machine learning models
- train and validate models with proper data sampling
- skills: python, javascript, tensorflow, postgres, machine learning, k8s, gcp

experience (cont.)

2016-2018 **Software Developer** nucleus.io

cloud-based diagnostic workstation with client-side MPR

- design and implement a client-side multi-planar reconstruction renderer
- design and implement a 3d compression algorithm for fast streaming
- design and implement annotation tools such as length, cobb angle, etc
- write highly optimized code using the latest web technologies
- ensure support for ct, mr, pet, ultrasound, large tomosynthesis, etc
- skills: javascript, nosql, mongodb, python, node, webgl, rendering, docker, azure

2016 (jun-dec) **Postdoctoral Fellow** CHUM research centre

improve image-guided prostate cancer brachytherapy treatments

- implement mr-ultrasound fusion and segmentation using machine learning
- study the impact of dual energy ct (dect) on current registration algorithms
- evaluate an experimental non-rigid mr-us fusion workflow in the operating room
- skills: python, tensorflow, machine learning, registration, segmentation

2009 (jan-sep) **Software Developer** CAE inc.

head-up display simulation for military flight simulators

- implement c/c++ modules to stimulate and simulate avionic systems
- implement an opengl solution to simulate a fighter hud
- work with clients to address issues and achieve acceptance
- skills: c, c++, pascal, opengl, simulation

2006-2008 **Research Assistant** École de technologie supérieure (ÉTS)

implementation of a standard compliance validation tool for hl7v3

- implement a hl7v3 for validation prior to connectathon
- provide support for implementors
- skills: java, xml, xml schemas, xslt, soap, dicom, ihe, hl7

implementation and evaluation of a medical image streaming framework

- evaluate jpip for large image stacks and large image streaming
- skills: java, jpip, jpeg 2000

awards

2017	**NSERC postdoctoral fellowship (declined)**	90,000$
2017	**FRQNT postdoctoral fellowship (declined)**	70,000$
2016	**GRSTB postdoctoral fellowship**	18,000$
2011	**NSERC doctoral Alexander-Graham-Bell scholarship**	105,000$
2011	**ÉTS excellence graduate student scholarship**	60,000$
2011	**FRQNT doctoral research scholarship (declined)**	60,000$
2009	**FRQNT master's research scholarship**	30,000$
2006	**NSERC undergraduate student research award**	4,500$

publications

patents

Efficient streaming for client-side medical rendering applications based on user interactions
J.F. Pambrun
US 20230036480, pending

Selection of health care data storage policy based on historical data storage patterns and/or patient characteristics using an artificial intelligence engine
Raffy P. , Pambrun J.F., Dubois D., Kumar A.
US 11868613, Jan. 2024

articles in peer-reviewed journals

Deep Learning Body Region Classification of MRI and CT Examinations
Raffy P. , Pambrun J.F., Kumar A., Dubois D., Patti J., Cairns R., Young R.
Journal of Digital Imaging. Springer, 2023

The utilization of MRI in the operating room
Ménard C , Pambrun J-F, Kadoury S
Brachytherapy. Elsevier, 2017

Computed Tomography Image Compressibility and Limitations of Compression Ratio-Based Guidelines
Pambrun J.F. , Noumeir R.
Journal of Digital Imaging. Springer Science, 2015

Teaching DICOM by Problem Solving.
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. Springer Science, 2012

Using JPEG 2000 Interactive Protocol to Stream a Large Image or a Large Image Set
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. Springer Science, 2010

international peer-reviewed conferences/proceedings

Limitations of the SSIM quality metric in the context of diagnostic imaging
Pambrun J.F. , Noumeir R.
IEEE International Conference on Image Processing (ICIP), 2015

Compressibility variations of JPEG2000 compressed computed tomography
Pambrun J.F. , Noumeir R.
IEEE International Conference of the Engineering in Medicine and Biology Society (EMBC), 2013

Perceptual quantitative quality assessment of JPEG2000 compressed ct images with various slice thicknesses
Pambrun J.F. , Noumeir R.
IEEE International Conference on Multimedia and Expo, 2011

Interoperability testing of integration profiles based on HL7 standard version 3
Pambrun J.F. , Noumeir R.
IEEE International Conference on Information Technology and Applications in Biomedicine, 2010

Streaming of Medical Images Using JPEG 2000 Interactive Protocol
Noumeir R. , Pambrun J.F.
IEEE International Conference on Systems, Signals and Image Processing. 2010

Images within the Electronic Health Record
Noumeir R. , Pambrun J.F.
IEEE International Conference on Image Processing. 2009